ThamesWey

Woking Town Centre Infrastructure Strategic Plan

1. Executive Summary

1.1 This paper is an update to a paper circulated to the Board in March 2020 and now includes the wider infrastructure within Woking as opposed a focus solely on Poole Road. This will enable the Board to better understand the context behind the funding requests set out in the Recommendations.

1.2 Thameswey Energy Ltd. Is currently undergoing its most significant growth phase since establishment of the company twenty years ago. This results from the coincidence of three primary factors:

- The scale and pace of redevelopment already underway and planned for the town centre
- The need to re-engineer energy supply to achieve lower carbon emissions following adoption by Thameswey and Woking Borough Council of the target to be carbon neutral by 2030
- The replacement of aging assets at the Victoria Way energy station to support the above two objectives.

1.3 This paper describes the major new energy infrastructure associated with this growth phase comprising:

- Construction of the Poole Road energy station and an initial 3MW of primary heat generating plant
- Construction of new district heat main distribution spine linking Poole Road with the Victoria Square development ('Project Green')
- Major plant replacement of existing generating assets at Victoria Way energy station to provide additional supply resilience
- Extension of existing district heat distribution infrastructure in the east side of the town centre ('Project Red')
- Installation of new district heat and chilled water mains connecting the existing town centre (Victoria Way) networks with the new (Poole Road) networks ('Project Black')
- A 6MW district cooling centre to supply chilled water to Victoria Square with capacity and distribution infrastructure to other new customers in the town centre
- New district heat and cooling distribution mains to supply new development south of the railway lines (including Harrington Place) facilitated by the widening of Victoria Arch funded by the Housing Infrastructure Fund (HIF) ('Project White')

- Construction of a new private wire HV distribution network including approximately 4km of electricity cables, a new DNO grid connection substation (at Board School Road), 10 new transformer substations and two network interconnector substations

- New fibre optic controls and data network including a new fibre ring connecting Poole Road energy centre to Board School Road substation

1.4 In the three years since the Thameswey Board approved the development of the Poole Road energy centre (April 2017), the project has both evolved in design and broadened in its scope. The design of the energy centre has undergone a number of iterations and the scheme that is currently under construction will provide a significantly more flexible facility that addresses the limitations of the original design and will deliver an asset that is substantially more future-proofed against uncertainties and changes that will arise during its operating lifetime. Of critical importance, the scheme under construction will assist Thameswey in responding to an accelerated programme of decarbonisation of heat supply in Woking town centre. The evolution of the design for the energy centre is set out in Section 2 of this report and Appendices 2-5.

1.5 Section 3 of the report summarises changes that have been made to the design of the energy distribution networks since April 2017. These include extending the new private wire network to reach across the entire town centre and constructing network interconnectors to enhance resilience of power supply. Co-ordination with the Victoria Square development has resulted in changes in design and route of district heat main distribution pipes to minimise impact on traffic flows along Victoria Way, and avoid disruption to Sir Robert McAlpine's programme. The design of some distribution infrastructure has also been upgraded in readiness to extend the network south of the railway lines following the award of a Housing Infrastructure grant (HIF) to widen Victoria Arch which will unlock development sites in that part of the town centre.

1.6 Section 4 describes the two significant infrastructure projects that have not yet commenced: 'Project Black' will improve resilience and release additional supply capacity for new customers in the east of the town centre; and 'Project White' will for the first time extend the reach of Thameswey's energy supply south of the railway to 3,000 new customers in the town centre.

1.7 Other factors that have influenced progress and scope of the project to date are discussed in Section 5. These comprise impacts on programme and opportunities that have arisen to source external funding to extend the reach of the energy systems and assist in decarbonising the generation of heat.

1.8 The anticipated financial impacts of the changes described in this report are set out in Section 6. These will lead to a request to Woking Borough Council to increase the borrowing limits for the Poole Road project.

2. Development of the energy centre scheme

2.1 The following chronology sets out the origins of this Poole Road project and summarises the evolution of the scheme that has resulted in significant changes in design, function and specification. Hence, the development that is currently under

construction is fundamentally different to the scheme that was first considered by the Board in 2017.

2.2 In 2013 the Council's Adopted Climate Change Supplementary Planning Document (SPD) identified the need for growth in sustainable energy generation to support new development in Woking town centre. The SPD identified potential locations for new energy centres including Poole Road, and delivery of this proposal has been a priority project in the TDL and TEL Business Plans since 2017.

2.3 The initial design for an energy centre on land at 9/9A Poole Road was granted planning consent in March 2017 and the Board agreed to take the scheme forward in April 2017. The scheme comprised a six storey mixed use building with five floors of office and other uses over the ground floor energy centre, with one floor to be used by the Woking Hockey museum (totalling approximately 2,100sq.m accommodation in addition to the energy centre) (Appendix 2).

2.4 The intent was for the scheme to be designed and built by the same architect/construction team delivering Victoria Square (Benoy/Sir Robert McAlpine) However, contractor feedback during procurement indicated the construction costs for the scheme rendered it economically unviable and presented a significant risk in taking forward a scheme which included two floors of speculative office floor space.

2.5 The acquisition by the Council of land at Format House adjoining 9/9A Poole Road provided the opportunity to reposition and redesign the energy centre to improve the viability of the scheme whilst also achieving greater operational flexibility of the energy centre components.

2.6 The majority of the office space was removed from the scheme and replaced with 247 co-living accommodation units in response to ThamesWey Housing's Business Plan priority to increase the diversity of housing product offered. The architectural treatment of the scheme was radically redesigned using more cost-effective materials and independent advice (from Design South East) was sought to assist in addressing the challenges of developing a taller building (Appendix 3).

2.7 However, the resulting 'PowerHouse' scheme was refused planning consent on 20 November 2018 despite a positive report from Planning Officers recommending approval and a positive Design South East Peer review. This scheme is currently the subject of a Planning appeal, with the Inspector's decision is expected within the next month or two.

2.8 Following refusal of planning consent for the PowerHouse scheme, the decision was taken to fast-track a simplified design for the energy centre component along with a single floor of office space. In parallel to amending the external design of the revised Energy Centre scheme to ensure the architectural treatment worked in a much reduced height of building, the design of internal spaces and specification of plant and equipment were significantly further developed in order to enhance the flexibility of the energy centre over its operational lifetime. The key driver for these changes was to ensure Poole Road would be capable of delivering a more rapid transition away from fossil fuel sources of energy.

2.9 In addition to future proofing the energy generating functions of the scheme, the building has also been designed to be capable of upward extension should the planning appeal be successful. Hence, the scheme that is now under construction embodies both functional and operational flexibility and is being built to provide

significant capacity for expansion in terms of delivering both low carbon energy generation and new residential accommodation. The foundations, structural frame, drainage and services, stair and lift cores have all been designed to be capable of accommodating up a building of up to 17 storeys (Appendix 4).

2.10 The Grenfell Tower fire in 2017 has led to enhanced standards of fire-proofing in many buildings. This has resulted in the adoption of changes in design and specification of alternative materials in both the PowerHouse and Energy Centre schemes.

2.11 The Energy Centre Scheme was granted planning consent on 22 March 2019. Following a tender process, main contractors were appointed in late 2019 and work on site commenced in January 2020. Appendix 5 compares the original scheme granted planning consent in 2017 and the final energy centre this is now under construction.

2.12 As no commitment could be made to deliver the hockey museum space within the required timescale, this component has not been taken forward in either of the PowerHouse nor the Energy Centre schemes and the Hockey Museum has located elsewhere in the town centre.

2.13 The delays in progressing the construction of the new energy centre have resulted in pressure for TEL to meet the target dates to supply first heat to Victoria Square. As a result, preparations are underway to install a temporary gas boiler to enable commissioning of heating services in Victoria Square prior to completion of Poole Road energy centre. This comprises modifications to gas supplies, new power and additional district heat injection points within the Peacocks services area. In addition, a temporary flue structure will be required.

3. New energy distribution infrastructure under construction

3.1 The following paragraphs summarise the changes to the distribution networks infrastructure that have resulted in significant changes in design, function and specification and cost.

3.2 The original energy centre scheme included a substation for point of connection to the High Voltage main grid. However, design amendments sought by the local Distribution Network Operator (DNO) required enlarging this substation to the extent it would reduce the space available for heat and power generation equipment within the energy centre. As a result, the decision was taken not to accommodate the substation within the building but to locate this component on land adjacent to the DNO's main town centre substation at Board School Road.

3.3 The new Board School Road substation is currently nearing completion and has significantly increased the reach of ThamesWey's high voltage Private Wire distribution network in the town centre. In addition to releasing space for generating equipment within the energy centre, this also has the twin advantages of offering further opportunities to acquire new customer connections en-route across the town centre and enabling two new high voltage interconnectors to be constructed. The interconnectors (one linking to ThamesWey's existing Peacocks substation the other via a new switching substation built last year at Dukes Court) will greatly increase the operating resilience of ThamesWey's electricity supply to customers by enabling

TEL's new and existing town centre networks to operate as independent rings that are capable of being linked in the event of a main substation failure.

3.4 The relocation of the main point of connection to the DNO grid has required the installation of an additional 1500m of electricity and fibre optic control cables, and significant civil engineering work throughout the town centre to install the carrier ducts. Installation of the Dukes Court switching substation and modifications to the Peacocks substation have also been carried out. It is important to note that if Thameswey had not chosen to locate the substation in Board School Road the DNO would have still have had to dig up this 1500m route to their main distribution network and would have charged Thameswey a significant sum to cover their cost.

3.5 The scope of distribution infrastructure within the Victoria Square development has been amended to include an increase in capacity of electrical transformer substations (from 1000kVA to 1500kVA in seven out of six substations), and individual heat substations for a number of commercial customers (including a proposal to include the new Marks and Spencer store).

3.6 The decision to redevelop the Red Car Park has also added to the scope of energy infrastructure. Two further high voltage transformer substations (in addition to the seven transformer substations already under construction by TEL) are currently being designed by TEL's consultants to supply the new car park and power to electric vehicle charging points, along with power supplies to two new commercial and leisure facilities planned for the ground and first floors. These premises will also have district heat and cooling supplies with dedicated plants interfaces comprising data controls, metering and plate heat exchangers, along with extensions to the district heat and chilled water distribution mains.

3.7 Following the Grenfell fire, enhanced design and materials have been specified to increase fire containment in the high voltage substations in Victoria Square.

3.8 The proposed route for district heat and cooling mains has been redesigned to avoid conflict with Sir Robert McAlpine's principal haul route. Originally conceived as a single shared services zone for all of TEL's distribution networks under the Victoria Way carriageway, TEL's hot and chilled water pipes have been separated from the HV and fibre optics ducts to minimise the risk of disruption to SRM's construction programme. As a result, an alternative route for the energy pipes is being installed above ground and at high level thought the Peacock's service area, attached to the western façade of the yellow car park and across the roofs of new and existing buildings. However, civil engineering works have still been required to install the HV and fibre carrier ducts under approximately 100m of Victoria Way.

3.9 Following the award of Housing Infrastructure Funding for the widening of Victoria Arch and enabling development sites to come forward south of the railway, TEL's main distribution pipes passing through Victoria Square have been 'over-sized' to ensure there is adequate network capacity to extend the network under the new Victoria Arch.

4. Projects Black and White

4.1 Individual new heating and power distribution projects in the town centre are identified by colour (i.e. Green: Poole Road to Victoria Square; Red: Church Street East to

Chertsey Road: Yellow: Private Wire Board School Road to Victoria Square etc). Project Black relates to the interconnection of the existing town centre district heat and chilled water mains with the new mains that will be supplied by Poole Road. This will increase the 'headroom' of capacity available to new customers in the east of the town by removing the constraint on supply available from Victoria Way energy station and enabling Poole Road to supplement generating capacity. The interconnection of the two networks will also assist in decarbonising the supply to existing customers connected to Victoria Way, and provide additional resilience.

4.2 Project Black comprises the final stage of interconnection between the 'old' and 'new' town centre networks and follows the interconnection of private wire HV distribution networks completed last year and the fibre optic data networks that will be joined during 2020.

4.3 Initial route planning and has been completed and the new heat and chilled water mains that are currently being constructed as part of Project Green have been installed with dedicated branches ready to connect to the Black interconnectors.

4.4 Project White relates to the major expansion of energy networks proposed south of the railway lines. This will be enabled by the replacement of the Victoria Arch railway bridge and road widening to be funded by the Housing Infrastructure Fund that is planned to commence in 2022. The widening of Victoria Arch unlocks development of over 3,000 new homes in the town centre, and Project White will provide the energy infrastructure to these homes.

4.5 Both Project Black and Project White are considered to be eligible for financial support through the Government's Heat Networks Investment Project (HNIP).

4.6 The infrastructure projects described above are shown on Appendix 1.

5. Other factors and considerations

5.1 The later completion of Victoria Square and Poole Road energy centre than originally anticipated has delayed the projected dates for TEL to commence sales of energy. In 2017, first energy sales were expected from 2019 onwards. However, revenues from energy supply to end customers are now not expected until late 2020, with significant revenue flows delayed until early 2021.

5.2 The introduction of Government funding to stimulate investment in heat networks (the Heat Networks Investment Project 'HNIP') and encourage the transition to lower carbon heat systems presents significant opportunities to support further expansion of generating capacity (including alternative fuels) at Poole Road and extend TEL's distribution infrastructure. However, the grant funding is time-limited and applications for HNIP support require substantial input to meet the qualification criteria. Therefore, a provision is to be made to secure external advice and expertise to assist in the preparation of supporting information and bid proposals. The Board's approval in principal is sought to making an application for HNIP funding.

6. Financial implications

6.1 The original scheme required funding of £26.1M, this was broken down to include capital expenditure of £23.0M and debt funding of £3.1M. The new scheme is broken down into its component parts below.

6.2 The energy centre is expected to cost £33.9M, with additional town centre infrastructure costing £5.1M. On the assumption that VSWL increases the contribution from £3.8M to £6.9M, debt funding required is £3.5M, bringing the total funding requirement to £35.6M. If VSWL are unable to increase funding, additional debt will be required.

6.3 The commercial element of the building, housing Thameswey office accommodation is budgeted to cost £1.9M, the rental income from TSCL will support the interest requirements and therefore no cashflow funding is required.

6.4 Future proofing the building will incur £1.2M loan via THL, this funding is already available via MTFS, therefore this is a comment as opposed to a request for additional funding. It is anticipated building apartments on top of the energy station will commence in as soon as the market allows but will be determined once the outcome of the current appeal is known. The asset will be retained in TDL until completion and sale to THL.

6.5 In total funding required is summarised in the table below, the assumption is VSWL contributes an additional £3.1M. The Board is requested to formally request that WBC approve this additional funding.

Table 1 Capex for asset expenditure (completed 2020, under construction and planned)

Infrastructure		£M
Poole Road (incl. office and CHP)		£33.9
Red Infrastructure		£1.5
TC Connections - 121, Waterman Hse, Cornerstone, Harrington		£1.2
Victoria Way Chiller Upgrade		£0.7
Town Centre Optimisation:		
➢ Boilers and Cooling Towers		£0.4
Project Black		£1.30
TOTAL Capex		£39.0
Poole Road Cashflow Funding		£3.5
TOTAL Funding Required		**£42.5**
VSWL Contribution - Initial		**-£3.8**
VSWL Contribution		**-£3.1**
Adjusted Funding Required		**£35.6**
Funding Agreed		**£26.1**
Incremental Funding Required		**£9.5**

6.6 The previous schemes have incurred planning costs of £1.3M, which are not relevant to this scheme, therefore these costs need to be written off.

6.7 Additional capital expenditure will be required to support energy provision in engine halls 2 and 3 and 'Project White' network extensions south of the railway. The effective date of additional capital expenditure is to be confirmed, however the expectation is circa 2024. Funding will be requested at a later stage although Board is asked to note that the overall funding model for Poole Road and the town centre energy network is dependent on this future infrastructure and connections.

6.8 The land acquisition is assumed to be £0, a minimal peppercorn lease charge is expected. Internal rate of return is 5.5% for the energy station and 4.5% for the office accommodation.

6.9 Previously agreed lending rate is PWLB plus 1% (regeneration rate), assumed to average at 3.6% over the development period. During development short term debt is proposed, converting to long term debt upon completion. However, if funding conditions are favourable long-term debt may be taken during the development period.

6.10 Total capex is £39M plus cash flow funding of £3.5m equals a peak debt of £42.5M, £6.9M being sought from VSWL. These figures exclude any grant contribution

secured from HNIP. The borrowing to be requested from the Council is required before the end of Q3 2020.

7. Recommendations

7.1 The Board is recommended to agree the following:

- Request VSWL increase their contribution from £3.8M to £6.9M for infrastructure supporting the Victoria Square development
- Request an increase in current borrowing approval from the Council to £35.6M to support wider energy infrastructure across the town centre
- Approve the principal of seeking HNIP funding towards further infrastructure development including project Black, new distribution networks south of the railway lines and within Poole Road

REPORT ENDS

APPENDIX 1

Existing connections
Planned connections
Future development sites

Heat network
Elements planned or in construction
Potential future routes

Woking Town Centre Infrastructure Development Plan

APPENDIX 2

Initial design for the scheme on land at 9/9A Poole Road (granted Planning consent 31 March 2017)

APPENDIX 3

The PowerHouse scheme comprising 247 co-living units over the energy centre (Currently subject to Planning appeal)

APPENDIX 4

The Energy Centre scheme under construction (granted Planning consent 22 March 2019)

APPENDIX 5

Constraints and opportunities analysis: initial energy centre scheme versus final scheme

Initial Scheme	Final scheme
Gross energy centre floorspace: 1026m^2 Total area of generator cells: 3 x 86m^2 Space available for roof plant: 465m^2	1700m^2 3 x 125m^2 790m^2
'Buildability' affected by limited space on site and close proximity to neighbouring building	Improved buildability with unbuilt area on site and no adjoining building
Thermal stores located on land only accessible for installation, inspection and maintenance via the fire station yard. Small stores positioned in a tightly spaced group	Thermal stores located within the development and spaced apart for ease of access, inspection and maintenance
DNO substation on ground floor reduces available space for generators	DNO substation at Board School Road, more space for generators or alternative heat plant
Large heat pipes located on above ground steel support structure linking energy centre and thermal stores	Not required
Access for large plant installation and removal via Butts Road requiring temporary closure of rear entrance to fire station	All access for large plant contained within the site
Cladding system costly to build and complex to remove and replace for access to plant	Cladding system simplified and easier to remove and re-fix to building
Plant room space only for 2 large shell and tube boilers (non-condensing)	Space available for multiple modular condensing boilers
Chimney flues built into façade. Cladding requires removal for inspection or maintenance. External access via specialist aerial access equipment. Future modification to flues difficult	Chimney flues in prefabricated modules within external supporting structure. Safe access platforms built in. Future modification of flues easier
No parking on site, roadside deliveries only	Secure compound provides parking on site for deliveries and mobile engineering staff
No space for emergency boiler plant or generators	Space available to accommodate packaged boiler plant or generators within secure compound
Sustainable drainage under the building with access chambers located within ground floor	Sustainable drainage located under compound
Limited on-site storage and workshop space	Large storage and workshop space with dedicated welding area, testing, de-greasing facilities etc